

AD-A066 677

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DEVICE FOR GENERATING POWERFUL ELECTRICAL PULSES, (U)  
DEC 78 B I KULIKOV, V M LAGUNOV  
FTD-ID(RS)T-2139-78

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DEVICE FOR GENERATING POWERFUL ELECTRICAL PULSES

By

B. I. Kulikov, V. M. Lagunov, et al



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79 03 12 251

ADA066677

## EDITED TRANSLATION

FTD-ID(RS)T-2139-78

26 December 1978

MICROFICHE NR: *AD-79-C-000004*

DEVICE FOR GENERATING POWERFUL ELECTRICAL PULSES

By: B. I. Kulikov, V. M. Lagunov, et al

English pages: 4

Source: USSR Patent Nr. 270059, 8 May 1970,  
pp. 1-2

Country of Origin: USSR

Translated by: Sgt Martin J. Folan

Requester: FTD/TQTD

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DOC	Ref Section <input type="checkbox"/>
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# U. S. BOARD ON GEOGRAPHIC NAMES TRANSLITERATION SYSTEM

Block	Italic	Transliteration	Block	Italic	Transliteration
А а	<b>А а</b>	A, a	Р р	<b>Р р</b>	R, r
Б б	<b>Б б</b>	B, b	С с	<b>С с</b>	S, s
В в	<b>В в</b>	V, v	Т т	<b>Т т</b>	T, t
Г г	<b>Г г</b>	G, g	У у	<b>У у</b>	U, u
Д д	<b>Д д</b>	D, d	Ф ф	<b>Ф ф</b>	F, f
Е е	<b>Е е</b>	Ye, ye; E, e*	Х х	<b>Х х</b>	Kh, kh
Ж ж	<b>Ж ж</b>	Zh, zh	Ц ц	<b>Ц ц</b>	Ts, ts
З з	<b>З з</b>	Z, z	Ч ч	<b>Ч ч</b>	Ch, ch
И и	<b>И и</b>	I, i	Ш ш	<b>Ш ш</b>	Sh, sh
Й й	<b>Й й</b>	Y, y	Щ щ	<b>Щ щ</b>	Shch, shch
К к	<b>К к</b>	K, k	Ъ ъ	<b>Ъ ъ</b>	"
Л л	<b>Л л</b>	L, l	Ы ы	<b>Ы ы</b>	Y, y
М м	<b>М м</b>	M, m	Ь ь	<b>Ь ь</b>	'
Н н	<b>Н н</b>	N, n	Э э	<b>Э э</b>	E, e
О о	<b>О о</b>	O, o	Ю ю	<b>Ю ю</b>	Yu, yu
П п	<b>П п</b>	P, p	Я я	<b>Я я</b>	Ya, ya

\*ye initially, after vowels, and after ъ, ы; e elsewhere.  
When written as ё in Russian, transliterate as yě or ě.

## RUSSIAN AND ENGLISH TRIGONOMETRIC FUNCTIONS

Russian	English	Russian	English	Russian	English
sin	sin	sh	sinh	arc sh	sinh <sup>-1</sup>
cos	cos	ch	cosh	arc ch	cosh <sup>-1</sup>
tg	tan	th	tanh	arc th	tanh <sup>-1</sup>
ctg	cot	cth	coth	arc cth	coth <sup>-1</sup>
sec	sec	sch	sech	arc sch	sech <sup>-1</sup>
cosec	csc	csch	csch	arc csch	csch <sup>-1</sup>

Russian      English

rot      curl  
lg      log



## DEVICE FOR GENERATING POWERFUL ELECTRICAL PULSES

B. I. Kulikov, V. M. Lagunov, Yu. Ye. Nesterikhin, V. M. Fedorov

The invention pertains to devices for generating electrical pulses with a steep growth front which can be used, for example, in experimental investigations requiring super-powerful pulses of current.

The devices designed for this purpose which contain a forming line and a discharger are known. Here, a battery is used which is selected from a large number of condensers. However, inductiveness of this system remains relatively high, which limits the maximum achievable speed of growth of current.

We propose a device in which the forming line is made in the form of three coaxial cylinders inserted into one another, the space between which is filled with water. The upper ends of the internal and exterior cylinders are connected by a ringed metal flange, and the middle cylinder, on the lower end, is fastened to the external cylinder with a ringed insulator, and on the lower end of the internal cylinder a three-electrode discharger is placed, filled with water. This gives the possibility to increase the energy-

content of the system, and the use of water in the discharger due to the large density of the medium ensures passage of large currents in small time intervals, and also increases repetition of activity.

For increasing reliability of the device, a gas-ballast chamber is placed on the upper end of the cylinders for gas at high pressure, which is separated from the water by a movable diaphragm.

The diagram reflects the device for generating pulses of current with an amplitude of 200 ka and length of growth of the front of  $5 \cdot 10^{-8}$  sec.

The device is made in the form of three coaxial cylinders inserted into one another 1 (length 2 m), the space between which is filled with water. The capacity of the forming line is 0.1 pF, wave resistance 1  $\Omega$ . Placed on the lower end of the forming line are electrodes 2, 3, and 4 of a three-electrode controlled discharger. The housing of the device is made of thick-walled metal cylinders, and the insulators 5 - of a material resistant to shock loads.

For absorbing energy of a hydraulic shock which arises with the actuation of the discharger, there is the gas-ballast chamber 6, filled with gas under a pressure of 20 atm. The water, before pouring, is degasified and purified by ionite and mechanical filters. The device can be equipped with a closed contour 7 for circulation and purification of the water.

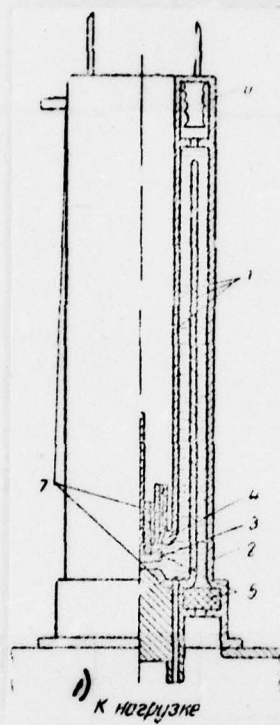
For increasing stress on the load and current amplitude, we can use a sequential-parallel conjunction of several similar devices, in which regard synchronization of the entire system is accomplished with the aid of controlled water discharges.

Subject of the invention

1. Device for generating powerful electrical pulses, containing forming line and three-electrode discharger, is distinguished by the fact that with the purpose of generating powerful current pulses with a steep growth front, the line is made in the form of three coaxial cylinders inserted into one another, the space between which is filled with water; the upper ends of the internal and external cylinders are joined by a ringed metal flange, and the middle cylinder, on the lower end, is fastened to the external cylinder with the aid of a ringed insulator, and on the lower end of the internal cylinder a three-electrode discharger is positioned and filled with water.

2. The device in paragraph 1 is distinguished by the fact that with the purpose of increasing its reliability, a gas-ballast chamber for gas at high pressure, which is separated from the water by a movable diaphragm, is positioned at the upper end of the cylinders. Figure. Key: 1 - to the load.

(see next page)





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